Arizona
Department of
Education

Mathematics Standards Chart for AIMS

Standards 1 through 6

Foundations Level (Grade 3)
Reflecting the Blueprint of 08.26.96

STANDARD 1: NUMBER SENSE

STANDARD 1: NUMBER SENSE Students develop number sense and use numbers and number relationships to acquire basic facts, to solve a wide variety of real-world problems, and to determine the reasonableness of results. *Students know and are able to do all the Readiness PO's, and the following:*	Number of Questions	
	8 - 10	**1**
CONCEPT/Performance Objective	**MC**	**SA**
1M-F1. Represent and use numbers in equivalent forms through the use of physical models, drawings, word names and symbols (e.g., using concrete materials and fraction equivalents to represent and compare halves, thirds, fourths, eighths and tenths)	**1 - 2**	**1**
PO 1. Make a model to represent a given whole number		
PO 2. Identify a whole number represented by a model with a word name and symbol		
PO 3. Construct equivalent forms of whole numbers (e.g., 15 + 5 = 10 + 10)		
PO 4. Make a model to represent a given fraction (e.g., geometric model—shading a picture, set model—part of an egg carton) (halves, thirds and fourths)		
PO 5. Identify the fraction represented by a model with a word name and symbol (halves, thirds and fourths)		
PO 6. Identify a given model that is divided into equal fractional parts (halves, thirds and fourths)		
1M-F2. Relate counting, grouping and place-value concepts to whole numbers (e.g., reading and writing the number represented when objects are grouped by thousands, hundreds, tens and ones)	**1 - 2**	**0**
PO 1. Read whole numbers up to one thousand		
PO 2. Write whole numbers up to one thousand		
PO 3. Order whole numbers (e.g., smallest to largest, largest to smallest) up to one thousand		
PO 4. Construct a model to represent place value concepts		
PO 5. Write whole numbers in expanded notation (e.g., 531 = 500 + 30 + 1)		
PO 6. Read aloud a whole number with correct place value words (e.g., a student will read 5 2 1 as "five hundred twenty-one.")		
PO 7. Count money to $5.00 using bills and coins		
1M-F3. Understand the meaning for and application of the operations of addition, subtraction, multiplication and division	**1 - 2**	**0**
PO 1. Demonstrate with models to show the process used in addition (joins things together, increases)		
PO 2. Demonstrate with models to show the process used in subtraction (takes away, compares, finds the difference, decreases)		
PO 3. Demonstrate with models to show the process used in multiplication (uses repeated addition, counts by multiples, combines things that come in groups of equal size, makes arrays, uses area models)		

STANDARD 1, continued		
CONCEPT/Performance Objective	**MC**	**SA**
1M-F3 - continued		
PO 4. Demonstrate with models to show the process used in division (puts things into groups of equal size, shares equally, uses repeated subtraction)		
PO 5. Demonstrate with models the operations of addition and subtraction up to two three-digit whole numbers		
PO 6. Select appropriate operations to solve word problems		
PO 7. Solve word problems using the appropriate operations		
PO 8. Apply mathematical operations in everyday situations		
1M-F4. Demonstrate proficiency with the operations of addition and subtraction of whole numbers	**2 - 4**	**0**
PO 1. Demonstrate proficiency with basic facts up to 20		
PO 2. Add and subtract two three-digit whole numbers		
PO 3. Solve problems using a variety of mental computations and estimation		
1M-F5. Demonstrate proficiency with the operations of multiplication and division of single-digit numbers	**1 - 2**	**0**
PO 1. Demonstrate proficiency with basic facts up to the fives		
PO 2. Solve problems using a variety of mental computations and estimation		
1M-F6. Add and subtract commonly used fractions and decimals	**1 - 2**	**0**
PO 1. Demonstrate with models addition and subtraction of fractions with common denominators (halves, thirds and fourths)		
PO 2. Add and subtract money up to $5.00		
1M-F7. Select and use appropriate techniques to facilitate computation (e.g., mental, estimation, paper-and-pencil, calculator and computer methods) while solving problems and determining reasonableness of results	**1 - 2**	**0**
PO 1. Select a computational technique to solve a problem		
PO 2. Solve a problem using the appropriate computational techniques		
PO 3. Evaluate the reasonableness of results using a variety of mental computation and estimation techniques (e.g., compatible numbers, front-end, chunking)		
PO 4. Use technology (e.g., calculators, computers, multi-media) to solve problems containing larger numbers		

STANDARD 2: DATA ANALYSIS AND PROBABILITY

STANDARD 2: DATA ANALYSIS AND PROBABILITY Students use data collection and analysis, statistics, and probability to make valid inferences, decisions and arguments and to solve a variety of real-world problems. *Students know and are able to do all the Readiness PO's, and the following:*	Number of Questions	
	3 - 5	**1**
CONCEPT/Performance Objective	**MC**	**SA**
2M-F1. Collect and analyze data using the concepts of largest, smallest, most often, less often and middle	**1 - 2**	**0**
PO 1. Collect and record data from surveys (e.g., favorite color or food, weight, ages) or experiments		
PO 2. Organize (e.g., sorting, sequencing, tallying) information from surveys or experiments		
PO 3. Identify largest, smallest, most often recorded (i.e., mode), least often and middle (i.e., median) using sorted data		
PO 4. Formulate questions from organized data		
2M-F2. Construct, read and interpret displays of data to make valid decisions, inferences and predictions	**1 - 2**	**1**
PO 1. Make and label a graph (horizontal bar, vertical bar, picture graph or tally chart) from organized data		
PO 2. Answer questions about a circle graph (i.e., pie graph) divided into ½'s and ¼'s		
PO 3. Answer questions about a pictograph where each symbol represents multiple units		
PO 4. Write a title representing the main idea of a graph		
PO 5. Locate points on a line graph (grid) using ordered pairs		
PO 6. Draw conclusions (e.g., valid decisions, conjectures and predictions) from graphed data		
PO 7. Formulate questions from graphs, charts and tables		
PO 8. Solve problems using graphs, charts and tables (e.g., given a bar graph on preferred flavors of ice cream, students have to decide what flavors of ice cream to order)		
2M-F3. Predict and measure the likelihood of events and recognize that the results of an experiment nay not match predicted outcomes. **Note: Probability experiments are simple one-step activities, e.g., tossing a two-colored counter**	**1 - 2**	**0**
PO 1. Collect and record data from a probability experiment		
PO 2. Organize (e.g., sorting, sequencing, tallying) data from a probability experiment		
PO 3. Name the possible outcomes of the probability experiment		
PO 4. Predict the most likely or least likely outcome in probability experiments		
PO 5. Compare the outcome of the experiment to the predictions		
2M-F4. Understand the concept of sample (i.e., that a larger sample of observed outcomes leads to more reliable information)	**0**	**0**
PO 1. Compare data from probability experiments where the experiments are performed a different number of times with the given expected outcomes (e.g., toss a two-colored counter 10 times, record the data; toss the counter 20 times, record the data; compare the results to the expected outcome [1 of 2])		

STANDARD 3: PATTERNS, ALGEBRA AND FUNCTIONS

STANDARD 3: PATTERNS, ALGEBRA AND FUNCTIONS	Number of Questions	
Students use algebraic methods to explore, model and describe patterns, relationships and functions involving numbers, shapes, data and graphs within a variety of real-world problem-solving situations. *Students know and are able to do all the Readiness PO's, and the following:*	7 - 9	1
CONCEPT/Performance Objective	**MC**	**SA**
3M-F1. Create, describe and extend a variety of patterns using shapes, events, designs and numbers **Note: Types of patterns include manipulatives, symbols, words, numbers and pictures**	1 - 2	1
PO 1. Create a pattern using a model (e.g., symbolically: numbers or letters; visually: shapes, designs, numbers or pictures; auditorally: clapping, singing or listening; and kinesthetically: dancing, movement or tactile)		
PO 2. Communicate orally or in written form the repetition of objects in a pattern		
PO 3. Communicate orally or in written form a given pattern occurring in a sequence of numbers (e.g., counting by 10's, 5's, 3's, 2's, odd, even, forward and backward)		
PO 4. Extend patterns using a model		
PO 5. Extend a given pattern occurring in a sequence of numbers		
3M-F2. Formulate generalizations about patterns (e.g., color, shape, size, direction, orientation) to make predictions	1 - 2	0
PO 1. Make predictions based on a given pattern		
3M-F3. Represent and describe how changing the value of one variable results in a change in another	0	0
PO 1. Describe in a given situation how a change in one variable results in the change of another (e.g., if you have to share a batch of cookies with friends, the more friends you have, the fewer cookies you'll each get)		
3M-F4. Represent and describe mathematical relationships such as order, grouping, etc. (e.g., given a string of numbers, describe the pattern, define the relationship between the numbers and determine the next number in line)	1 - 2	0
PO 1. Identify the pattern in skip counting		
PO 2. Determine the next number in a skip counting pattern		
3M-F5. Recognize the symbols of equality and inequality	1 - 2	0
PO 1. Use the symbols (<, >, =) to compare whole numbers		
3M-F6. Find missing elements in number sentences	1 - 2	0
PO 1. Find the missing number in addition and subtraction number sentences		

STANDARD 4: GEOMETRY

STANDARD 4: GEOMETRY Students use geometric methods, properties and relationships as a means to recognize, draw, describe, connect, and analyze shapes and representations in the physical world. *Students know and are able to do all the Readiness PO's, and the following:*	Number of Questions	
	5	1
CONCEPT/Performance Objective	MC	SA
4M-F1. Relate geometric concepts to number and measurement ideas (e.g., dividing a rectangle into parts to represent multiplication) Note: • two-dimensional shapes: square, rectangle, triangle, circle • three-dimensional figures: sphere, cube, rectangular prism (box), cone, pyramid • attributes: size, shape, the number of sides, corners and faces	4	1
PO 1. Identify two-dimensional shapes by name and attribute		
PO 2. Draw two-dimensional shapes		
PO 3. Identify three-dimensional figures by name and/or attribute		
PO 4. Compare attributes of two-dimensional shapes		
PO 5. Compare attributes of three-dimensional figures		
PO 6. Use a rectangular array to represent a multiplication fact (e.g., put 12 tiles in a rectangular array; make a 3 × 4, 6 × 2, and 12 × 1 array)		
4M-F2. Predict how shapes can be changed by combining or dividing them	1	0
PO 1. Build geometric shapes with other common shapes (e.g., tangrams, pattern blocks, geoboards)		

STANDARD 5: MEASUREMENT AND DISCRETE MATHEMATICS

STANDARD 5: MEASUREMENT AND DISCRETE MATHEMATICS Students make and use direct and indirect measurement, metric and U.S. customary, to describe and compare the real world and to prepare for the study of discrete functions, fractals and chaos which have evolved out of the age of technology. *Students know and are able to do all the Readiness PO's, and the following:*	Number of Questions	
	4	0
CONCEPT/Performance Objective	MC	SA
5M-F1. Demonstrate that a single object has different attributes that can be measured in different ways (e.g., length, mass/weight, time, temperature, area and volume)	0	0
PO 1. Determine the characteristics (attributes) of an object that are measurable (e.g., length and weight are measurable; color and texture are not measurable)		
PO 2. Identify the type of measure (e.g., weight, height, volume) for each attribute		

STANDARD 5, continued		
CONCEPT/Performance Objective	**MC**	**SA**
5M-F2. Explain the concepts related to units of measure and demonstrate the process of measurement with non-standard (e.g., using paper clip lengths), U.S. customary and metric units	**2**	**0**
PO 1. Select the appropriate unit of measure for a given characteristic of an object: length — inches, feet and yards, centimeters and meters capacity/volume — cups, gallons and liters mass/weight — ounces, pounds, grams and kilograms		
PO 2. Select the appropriate tool to measure the given characteristic of an object (e.g., ruler, thermometer, measuring cup, scale)		
PO 3. Measure a given characteristic of an object using non-standard units of measure		
PO 4. Measure a given characteristic of an object using standard units of measure		
PO 5. Tell time to the nearest minute on digital and traditional (analog) clocks		
PO 6. Determine the passage of time (i.e., units of days, months, and years) using a calendar		
PO 7. Compare units of measure to determine more or less relationships length — inches and feet feet and yards centimeters and meters capacity — cups and gallons mass — ounces and pounds grams and kilograms time — minutes and hours hours and days days and weeks months and years money — pennies, nickels, dimes, quarters and dollars		
PO 8. Compare units of measure to determine equivalent relationships length — inches to feet time — minutes to hours days to weeks months to years money — pennies, nickels, dimes, quarters to dollars		
PO 9. Read a thermometer in Celsius and Fahrenheit to the nearest degree		
5M-F3. Make estimates of measurement	**0**	**0**
PO 1. Estimate a measurement		
PO 2. Compare the estimation to actual measure		
PO 3. Evaluate the reasonableness of the estimate		
5M-F4. Use discrete mathematical models for graphs to represent everyday situations (e.g., determine how many ways to move from point A to point B on a grid)	**2**	**0**
PO 1. Make a diagram to represent the number or combinations between two sets (e.g., "How many outfits can one make with three different colors of shirts and two different pairs of pants?")		

STANDARD 6: MATHEMATICAL STRUCTURE/LOGIC

STANDARD 6: MATHEMATICAL STRUCTURE/LOGIC Students use both inductive and deductive reasoning as they make conjectures and test the validity of arguments.	Number of Questions	
Students know and are able to do all the Readiness PO's, and the following:	6	1
CONCEPT/Performance Objective	MC	SA
6M-F1. Recognize that numbers are used for different purposes in the world and a variety of mathematical notations represent these situations	0	1
PO 1. Formulate mathematical problems from everyday situations		1
6M-F2. Draw inductive and deductive conclusions about mathematics	3	0
PO 1. Extend a pattern using inductive reasoning (e.g., "What is the next number after 2, 4, 6, 8?")		
PO 2. Make a prediction based on existing information (e.g., "All the students in a third grade class are under 10 years old. How old will the next new student probably be?"		
6M-F3. Distinguish between relevant and irrelevant information	0	0
PO 1. Select the information necessary to solve a given problem		
6M-F4. Interpret statements made with precise language of logic (e.g., all, every, none, some, or, many)	3	0
PO 1. Use words such as *all*, *every*, *none*, *some* and *many* to make reasonable conclusions about situations		

TOTAL NUMBER OF AIMS FOUNDATIONS (GRADE 3) MATHEMATICS QUESTIONS	34	5
	MC	SA
TOTAL NUMBER OF AIMS FOUNDATIONS (GRADE 3) MATHEMATICS POINTS	34	10

NOTE: Mathematics assesses points by concept, not by performance objective.

*All concepts with a number greater than 0 in the "Number of Questions" column will be assessed on every AIMS test form. However, the number of points per concept and the total number of total points possible will vary slightly from form to form.